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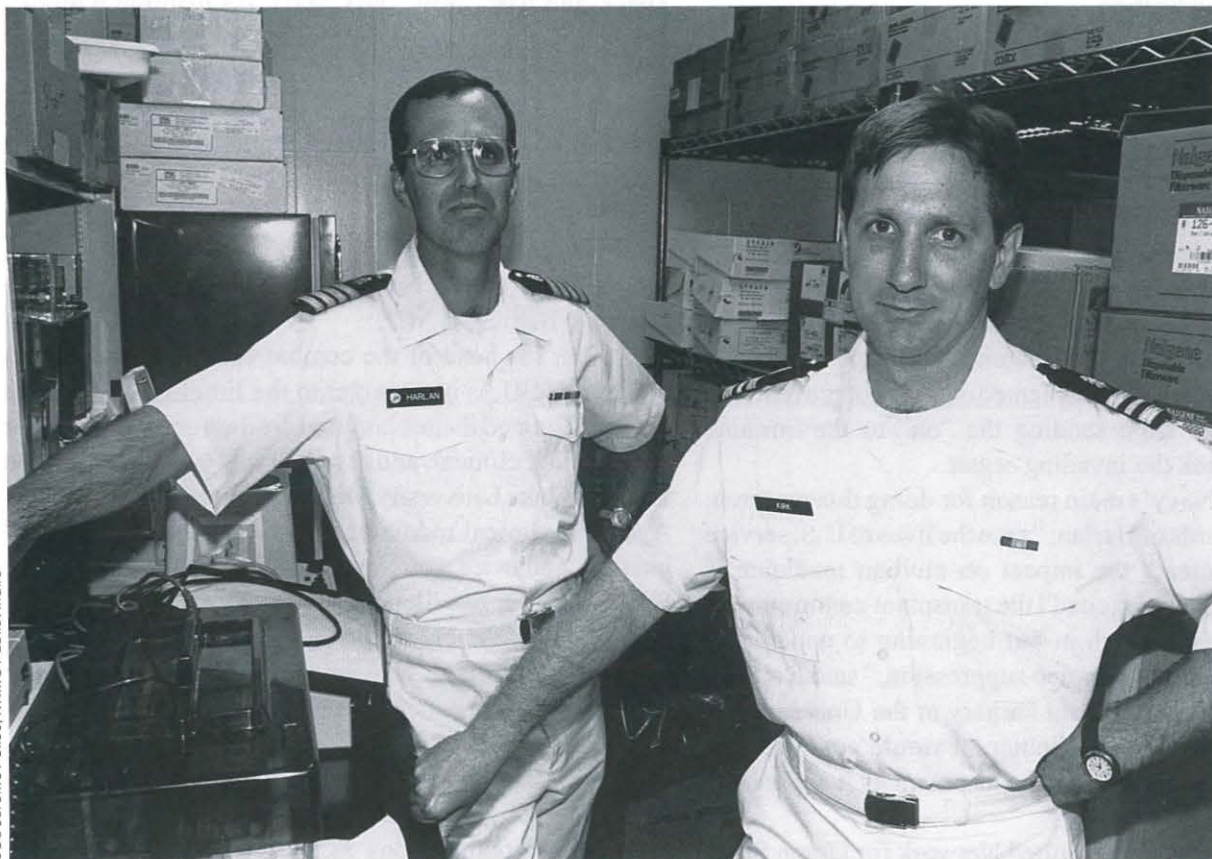
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COVER: The four living Hospital Corps Medal of Honor recipients were recently honored at the Surgeon General's Leadership Conference. Left to right: George Wahlen, Donald Ballard, William Charette, Robert Bush. Story on page 15. Photo by Biomedical Photography, NSHS, Bethesda, MD.

Navy Researchers Make Organ Transplant Breakthrough



Researchers CAPT Harlan (left) and LCDR Kirk of the Naval Medical Research Institute, Bethesda, MD

"This is almost the stuff of science fiction to me! Gentlemen, you have your nation's admiration."—ABC's "Good Morning, America!" co-host Tom Bergeron to CAPT David Harlan, MC, and LCDR Allan Kirk, MC

Navy medical researchers have reached a significant milestone in medicine's search to find a way to prevent "mismatched" transplanted organs from being rejected.

CAPT Harlan and LCDR Kirk announced their findings at a press conference at the Pentagon the same day the *Proceedings of the National Academy of Science* pub-

lished a summary of the research. Harlan and Kirk tested a novel medical therapy that seems to prevent the rejection of transplanted organs—even organs that are completely mismatched. While the precise mechanism preventing the organ rejection remains unclear, the research suggests the immune system is "re-educated" to leave the transplanted organ alone.

Currently, individuals in need of a transplant must wait for an organ from a suitably matched donor. After receiving the transplant, individuals must take very expensive anti-rejection medications for the rest of their lives to prevent the organ from being attacked and destroyed by

their own immune system. These drugs—the very drugs that are saving their lives by preventing the organ rejection—often have significant unpleasant side effects and increase susceptibility to infections and tumors.

As part of their research, the Navy team transplanted very mismatched kidneys into nonhuman primates and treated them with the new therapy for 28 days after the operation. No other therapy, including anti-rejection drugs, was administered. Six months later, the primates are robust and suffering no significant side effects. Not only does the therapy allow mismatched organs to be accepted as “own,” but it appears to be long-lasting, precluding the use of daily medication.

“This is in stark contrast to conventional immunosuppression (therapy), where drug withdrawal will rapidly lead to rejection, often within a week,” said Kirk.

Harlan, Kirk, and their colleagues based this immunology research on earlier Navy medical research that suggested some immune responses could be turned “off” or “on” at will. According to Kirk, controlling this off and on response is a special class of white blood cells, T-lymphocytes, which “marshal the immune system forces to destroy the target.” The researchers’ therapy allows the body to recognize the transplanted organs, but prevents the T-lymphocytes from sending the “on” to the immune system to attack the invading organ.

While the Navy’s main reason for doing this research, is to, in the words of Harlan, “save the lives of U.S. service men and women,” the impact on civilian medicine is enormous and has “excited” the transplant community.

“It is a breakthrough in our beginning to understand another approach to immune suppression,” said Dr. John J. Fung, chief of transplant surgery at the University of Pittsburgh (PA) Medical Center. “I would not have predicted this technique would be as potent as it apparently is.”

Joel Newman, of the United Network for Organ Sharing (UNOS), the Richmond, Virginia-based national organ allocation center, said almost 4,000 Americans died in 1996 as they waited for a compatible donor. As of 30 July 1997, it listed more than 53,000 people awaiting transplants.

According to UNOS, about 150,000 people in the United States have had organs transplanted into them since 1983 when anti-rejection medications became widely used.

According to Harlan, in addition to preventing organ transplant rejection, the research may provide help for people with other immune system illnesses as well. These range from the severe and potentially life-threatening diseases such as multiple sclerosis and lupus to the relatively innocuous but annoying hay fever. And while hay

fever can be classified as “annoying” rather than life threatening, it can have a big impact on the military. Navy pilots cost about \$1 million to train, and can be grounded by hay fever symptoms. A treatment without side effects can save millions of taxpayer dollars in the aviation community alone.

Even before the press conference, Harlan and Kirk were invited to New York City to appear on ABC’s “Good Morning, America!” to talk about their findings with co-host Tom Bergeron. Their findings were covered by virtually every major newspaper in America, including the *New York Times*, *Washington Post*, and *Los Angeles Times*, and ABC, NBC, Fox, and CBS featured it prominently in their evening news broadcasts. British and Japanese media also reported on the research. The Chief of Naval Operations sent them both personal notes of congratulations, and the Department of Defense sent word the researchers had “hit a home run!”

Now that much of the excitement has died down, Harlan and Kirk have returned to their research. Both physicians are assigned to the Naval Medical Research Institute (NMRI), Bethesda, MD.

Harlan, the head of the combat casualty care department at NMRI, is no stranger to the limelight. He’s long been recognized in the Navy and civilian communities for his teaching, clinical, and research achievements. He was awarded Duke University Medical Center’s Haskel Schiff Award in clinical medicine, which recognizes the ideal internist, and twice won Naval Medical Center San Diego’s Stitt Award for excellence in teaching.

Until just days before the announcement, Kirk was a naval reservist on an “outservice” clinical fellowship in kidney, liver, and pancreas transplantation at the University of Wisconsin-Madison, spending his weekend drills giving physicals to fellow reservists at the Naval Reserve Center in Madison. His work has been recognized by such prestigious organizations as the American Society of Transplant Physicians and the American Society of Histocompatibility and Immunogenetics. He has a Ph.D. in immunology and is now on active duty.

Others collaborating on the research include Dr. Tom Davis and researchers at NMRI, transplant surgeon Dr. Stuart Knechtle and his colleagues at the University of Wisconsin-Madison, and scientists from the Navy’s civilian partner organizations. Many of the funds to support this research came from the Office of Naval Research, a long-time supporter of naval medical research. □

—Story by LCDR Jan Davis, USNR, NR BUMED 106, Washington, DC.



Mrs. O'Bannon Wilson holds the Silver Star medal and citation of her late husband.

Teamwork Under Fire

"SGT O'Bannon was one of the bravest and most respected Marines I ever knew in Vietnam. He loved the Marine Corps; he was a Marine of uncommon valor."

Thus said former Navy corpsman HM2 Roger Pittman to LCOL George F. Warren, USMC (Ret.), Operations Officer of Battalion Landing Team 2/4 with the 9th Marine Amphibious Brigade stationed in Vietnam during 1968. Pittman wrote to Warren in July 1996 with something that had been weighing heavily on his mind for nearly 30 years and inquired about the process of recommending an award for bravery for Marine Sergeant Robert O'Bannon, United States Marine Corps Reserve.

As a corpsman in Vietnam, Pittman reported that he had witnessed many acts of unselfish bravery, most of which had gone unrecognized; however, he felt an urgency to tell

O'Bannon's story. The former corpsman believed that SGT O'Bannon's personal bravery demonstrated the very best that America and the Marine Corps had to offer, and he thought the Marine Corps should honor the sergeant. Pittman wanted O'Bannon's family to know just what an honorable and exceptionally brave man he was. With astounding accuracy in detail and in such moving and well-chosen words, the corpsman was able to describe in his letter to LCOL Warren the heroic actions of SGT O'Bannon. The story was so beautifully told that Warren immediately assumed responsibility to go forward with it.

LCOL Warren sent copies of Pittman's letter to BGEN William Weise, USMC (Ret.) (O'Bannon's former Battalion Commander and a Navy Cross recipient), and to MGEN James Livingston, USMC (Ret.) (O'Bannon's

Company Commander and a Medal of Honor recipient). He also sent a copy of the letter to GEN Charles C. Krulak, Commandant of the Marine Corps. And so the wheels were then set in motion.

In September 1996, LCOL Warren was notified by the Military Awards Branch at Headquarters, Marine Corps that "Since the prescribed time limits for awarding the Silver Star Medal to Sergeant O'Bannon had expired . . . that a waiver was necessary and would be requested." The recommendation needed approval from the HQMC Board, endorsement by the Commandant, approval from the SECNAV Board, and signature by the Secretary of Navy. LCOL Warren was notified by telephone that SGT O'Bannon had been awarded a Silver Star by the Secretary of the Navy on 19 Feb 1997.

On 5 June 1997, a touching presentation ceremony was held at Headquarters of the 2nd Battalion, 4th Marines at Camp Mateo, MCB Camp Pendleton, CA. O'Bannon's wife and family, with Pittman, were present for this special occasion.

Representing the Commandant of the Marine Corps was BGEN Christopher Cortez, the Assistant Commanding General of 1st Marine Division. RADM Richard Nelson, MC, Commander of Naval Medical Center San Diego, CA, along with CAPT Thomas Burkhard, Commanding Officer of Naval Hospital Camp Pendleton, represented the Surgeon General of the Navy.

The ceremony was also attended by the following members of the 2nd Battalion, 4th Marines Association: BGEN Weise; COL James Williams, USMC (Ret.) (Navy Cross Recipient); LCOL Warren; SGTMAJ Charles Otto, USMC (Ret.); and HMC Walter Gorsage, USN (Ret.).

Letters from two Medal of Honor recipients were read, one from MGEN Livingston and one from Jay R. Vargas, Secretary of Veterans' Affairs, who also was with 2nd Battalion, 4th Marines at the time O'Bannon was killed.

Finally, after almost 30 years, SGT Robert O'Bannon III, USMCR, was posthumously awarded the Silver Star medal for gallantry in action on 13 March 1968. Signed by John H. Dalton for the President of the United States, SGT O'Bannon's citation read:

"For conspicuous gallantry and intrepidity in action while serving as a Platoon Guide, Battalion Landing Team, 2nd Platoon, Company E, 2nd Battalion, 4th Marines, 9th Marine Amphibious Brigade in connection with operations against the enemy in the Republic of Vietnam on 13 March 1968. While engaged in the recovery of Marines killed in action in the village of Lam

Xuan the previous day, the Platoon began to receive heavy machine gun and small arms fire from a concealed North Vietnamese Army force which wounded several Marines located in a trench in front of the Platoon's defensive position. Although the enemy was located in a tree line approximately 30 to 40 feet from the Platoon's defensive position, Sergeant O'Bannon fearlessly stood up exposing himself to intense enemy fire while providing suppressive fire so that a Hospital Corpsman could reach and treat a wounded Marine located in the trench. With total disregard for his own safety, he continued to expose himself to the enemy fire in order to provide covering fire for the Hospital Corpsman while he treated the wounded Marine. Under a hail of machine gun and rifle fire, and rocket-propelled grenades, he dashed across the fire swept areas to assist the Hospital Corpsman in carrying the wounded Marine to an area of relative safety. Sergeant O'Bannon's courageous actions, unselfishness, and unwavering devotion to duty reflected great credit upon himself and were in keeping with the highest traditions of the Marine Corps and the United States Naval Service."

Five days later on 18 March 1968, SGT O'Bannon was killed in action while assaulting Vinh Quan Thuong, another small village just a few kilometers away from Lam Xuan. "He was up and moving as usual when a mortar round hit just behind him," Pittman reported in his letter to LCOL Warren.

The hospital corpsman mentioned in O'Bannon's Silver Star citation is, of course, Roger Pittman. On a recent return visit to Vietnam, Pittman placed, at the request of O'Bannon's family, a crucifix near the death site of this heroic Marine.

"Doc" Pittman finished his Vietnam tour in October 1968 and was released from active duty in May 1969. Married with two daughters and one granddaughter, he is now a senior partner in a physician's assistant practice in Denver, CO. This ex-Navy corpsman still feels a deep and special bond with Marines. □

—Story by Anne C. Severy, Public Affairs, Naval Hospital Camp Pendleton, CA.

History of Family Medicine in the Navy

CDR Richard W. Emerine, MC, USN
RADM Robert Higgins, MC, USN (Ret.)
RADM David Frost, MC, USN (Ret.)
CAPT Richard Jeffries, MC, USN

Innovative and creative physicians dating back to the 1940's blazed the development trail for the specialty of family practice (FP) in the United States Navy. The family physician's fine heritage and tradition will be recounted and recorded for posterity. We will provide an overview of the historical steps in the early development of FP as a recognized specialty in the Navy. Finally, we will identify some challenges for present and future family physicians.

In 1910, the Flexner Report championed the Johns Hopkins School of Medicine model for training that recommended research, inpatient teaching, and consultant care as roles for medical education. The faculty was entirely composed of specialists (consultants). The Francis Peabody Report of 1923 called attention to an alarming trend toward overspecialization and the need to redirect the distribution of physicians toward primary care.^(1,2) Obviously, his advice was unheeded since between 1930 and

1962 the percentage of physicians in general practice (GP) went down from 71 percent to 27 percent. In 1941, Dr. George Dillinger presented a call for a GP certifying board to the American Medical Association (AMA) House of Delegates. In 1947, the American Academy of General Practice (AAGP) was organized. The earliest training programs, within the military and civilian setting in 1948, were 1-year rotating internships.⁽³⁾

In 1969, with a reported 55 million U.S. citizens without access to medi-

cal care, FP was defined and the American Board of Family Practice (ABFP, Inc.) was created. The ABFP, Inc. approved the first FP residencies at Indiana University, University of Arkansas, University of Michigan, and Bowman Gray University.(3)

In 1966, the Millis Report, entitled the "Report of the Citizen Committee on Graduate Medical Education (GME) of the AMA," identified the role of the primary physician as one who delivers continuing, comprehensive health care.(2-4) Further, it recommended the training of more primary physicians through the creation of a generalist specialty. Similarly, the "AMA Ad Hoc Committee on Education for Family Practice" better known as the Willard Report (1966) called for greater emphasis on training physicians in primary care. This committee called for the new specialty of FP to include a certification board attained through practice or residency eligibility.(2,3,5)

On 8 Feb 1969, the 20th medical specialty, family practice, was born. The AAGP was subsequently changed to the American Academy of Family Physicians (AAFP), with formal certification being the charge of the American Board of Family Practice (ABFP).(3,6)

During the 1940's, military and civilian programs offered rotating GP internships which formed the basis of generalist education.(6,7) In the early 1970's, rotating internships were begun at Naval Hospitals Jacksonville and Pensacola, FL. By 1973, both sites offered 3-year GME programs in FP. Naval Hospitals Charleston, SC, and Camp Pendleton, CA, initially offered 2-year FP programs which later converted to standard 3-year FP programs. The first Navy FP residency was begun at Naval Hospital Jacksonville and was directed by Drs. Jim Baggett and John DeSimone. Next

was Naval Hospital Pensacola, led by Drs. George Bingham and Tim Harrington, followed by Naval Hospital Charleston, headed by Drs. Robert Higgins and Tom Enoch, and finally Naval Hospital Camp Pendleton, directed by Drs. Paul Flandermeyer and Paul Bagnulo.(7)

By 1974, each had full 3-year programs. A fifth program at Naval Hospital Long Beach, CA, failed to materialize. In 1980, Naval Hospital Bremerton, WA, opened the Navy's fifth FP residency, headed by Drs. Robert Higgins and Mike Harrington. Closed in 1986 due to other Navy medicine priorities, it was later reopened in 1992 and is presently being considered for closure yet again.

Today, family physicians are pursuing not only the basic training inherent in a 3-year FP training program, but are adding additional skills in such diverse areas as adolescent medicine, faculty development, geriatrics, obstetrics, and sports medicine. These fellowship-trained family physicians are assigned to FP residency programs, which enhances the basic FP training experience.

Early leaders in Navy FP had several hurdles to overcome in the formative specialty years. Hospital departmental status, patient empanelment as a basic tenet, FP specialty growth in the Navy, increasing demand by the operational forces for family physicians, and the need for practice-specific credentials were the five areas where the most significant efforts took place. FP specialty advisors to Surgeons General have played substantial roles in helping to define the future overall physician matrix for Navy medicine. Importantly, they identified optimal roles for family physicians in both peacetime and operational settings. The FP specialty advisor is a resource for both the Surgeon Gen-

eral as well as for all Navy family physicians.

Aware of the need to assume significant operational responsibilities in order to achieve specialty growth in the Navy, the early leaders were strong advocates for FP roles and billets that resulted in operational medicine excellence and consequent favorable line recognition. CAPT Gerald Nowak's assignment to the Navy IG team in the early 1980's resulted in further emphasis on the Navy's need for family physicians. Success of family physicians overseas and in isolated duty stations underscored the unique abilities of the family physician and set him apart from the general medical officer. Key operational positions have included senior medical officer aboard the Navy's battleships, division surgeons, camp surgeons, and regimental surgeons attached to the Marine Corps, and officers-in-charge (OIC) of fleet surgical teams.(7) Senior assignments have included Marine Forces Forward (MARFOR) surgeon who is responsible for deployable forces health care support and Amphibious Task Force (CATF) surgeons responsible for all amphibious health care support.(7)

Most important is what family physicians do on a daily basis. As an advocate for their patients in a family context, they orchestrate comprehensive family health care. It is the continuity of care offered by the family physician in a wide variety of settings that serves as a major determinant of success when dealing with the line communities. From Diego Garcia to Parris Island, SC, and Bethesda, MD, Navy family physicians demonstrate their unique versatility.

Navy medicine has wisely sought opportunities to develop the "family practice model" which has been successful in Newport, RI; Rota, Spain; and most recently Groton, CT;

Yokosuka, Japan; and the Primary Care Initiative at Bethesda.⁽⁷⁾ Capable of providing comprehensive family care to the entire community at each site, staffing has been sufficiently robust while creativity and innovation have been strongly promoted. The cooperative working relationships with the civilian medical establishment has resulted in extraordinarily high levels of patient and provider satisfaction. Similar staffing for family physicians at other Navy hospitals and clinics would enable Navy medicine to better compete in the managed care arena.

More recently, family physicians have played significant roles as a member on the Medical Education Policy Council, the Total Health Care Support Readiness Requirements (THCSRR) Task Force, the "Small Hospital Initiative" team, several Primary Care Initiative Groups, and in other top management areas.⁽⁷⁾ A plan to develop a new FP residency-based model in a major tertiary treatment and training center at Naval Hospital Portsmouth, VA, has been developed and can be implemented if necessary. Family physicians are making significant contributions at the three tertiary care centers of Bethesda, Portsmouth, and San Diego, CA. This new role of the family physician serving as the primary care teacher for other specialties is an apt paradigm for the future, as clinical care migrates toward ambulatory settings.

The success of the operational family physician has been and continues to be well recognized and valued in the Navy organization. Family physicians are experienced at networking with line counterparts to improve health care on a systems basis. Both literally and figuratively, the family physician is on the cutting edge with capabilities to provide a full spectrum of family care to patients in remote settings as well as in teaching centers.

Table 1*
Family Physicians as Commanding Officers
(As of 1 Sept 1997)

Family Physician	Hospital (Dates)
Ollie Emerine	Millington, TN (1981-83)
Roger Case	Lemoore, CA (1983-86)
Robert Higgins	Camp Pendleton, CA (1986-87)
Bill Jackman	Philadelphia, PA (1986-89)
David Frost	Camp Pendleton, CA (1989-91)
Fred Jackson	Oak Harbor, WA (1989-91) Long Beach, CA (1991-93)
Jim Senn	Patuxent River, MD (1989-92)
John Aguilar	Rota, Spain (1991-95)
Vertrees Hollingsworth	Newport, RI (1991-93) Jacksonville, FL (1993-95), HSO (95 +)
Robert Hufstader	Keflavik, Iceland (1991-93)
Michael Murphy	Oak Harbor, WA (1991-93)
Mark Brown	Beaufort, SC (1993-96)
R.B. Hall	Groton, CT (1994-Present)
Clinton Adams	Beaufort, SC (1996-Present)

*Please notify the author to make corrections or update this list.

A measure of individual success in the Navy is the assignment to positions of greater responsibility, with the position of commanding officer (CO) being the pinnacle of success. CAPT Ollie B. Emerine was the first family

physician to become a CO in 1981. Since then, many Navy family physicians have served or are now serving as COs in Navy medicine (Table 1).⁽⁷⁾ The far-reaching vision of the FP leaders and the dedication of all fam-

Table 2
Present Residency Department Heads and
Directors of Residency Training
(As of 1 Sept 1997)

Residency	Department Head	Director of Residency*
Naval Hospital Bremerton, WA	CAPT Jeffrey Brodie	CDR Robert Ringler
Naval Hospital Camp Pendleton, CA	CAPT William Roberts	CAPT Richard Jeffries
Naval Hospital Pensacola, FL	CAPT Milton Mays	CAPT Donald Mason
Naval Hospital Jacksonville, FL	CDR Robert Raspa	CDR Steve Oosterman

*All listed are Associate Program Directors/Directors of Residency Training, except for Dr. Jeffries who is Program Director.

ily physicians have been instrumental in furthering the role of the Navy family physician and carrying Navy medicine to heights of greatness.

One individual stands out among the family physician founders in Navy medicine. Dr. Robert Higgins could rightly be called the "Father" of Navy family practice. His hand was clearly evident in the development of three of the five FP residency programs. Nationally known, he served as the chairman of the board of directors of the American Academy of Family Physicians (AAFP) and president in 1984.(7) It was through his efforts and others of our sister services that a highly successful state equivalent chapter, the Uniformed Services Academy of Family Physicians, was formed.

Dr. Higgins achieved another Navy family physician milestone when promoted to the rank of rear admiral in 1987. He later received a second star and served as the Deputy Surgeon General for the Navy and Chief of the Navy Medical Corps until his retirement in 1993.

Dr. David Frost became the first FP residency-trained physician to be selected to flag rank. He served as the U.S. Pacific Command Surgeon and the Naval Medical Inspector General before his retirement in 1996.(7)

In less than a quarter of a century, the specialty of family practice has achieved an important place in Navy medicine. Family physicians have repeatedly proven their worth in peacetime and in conflicts such as Operation Desert Storm, humanitarian operations, such as Somalia, Bosnia, Haiti, and Cuba, and in assisting the ongoing search for our missing in action in Southeast Asia with the Joint Task Force Full Accounting missions.(7)

The future will require no less of its family physicians and probably a lot

more. As Navy medicine migrates toward managed health care at the waterfront, deckplates, and front lines, the family physician will lead the call. Their creative energies will need to be fully exploited as imperatives for cost containment, efficiency, and commitment to health promotion emerge as priorities in a capitated DOD health care system. They will need to work in harmony not only with the other primary care areas, such as internal medicine and pediatrics, but also with our specialist and subspecialist peers. This multidisciplinary team, when adequately staffed and resourced, will provide all beneficiaries with optimal, cost-effective family health care. Just as family practice broke with "tradition" in 1969, Navy medicine is now breaking away from the traditional hospital-based health care system of the past century.

The Tri-Service Primary Care Planning Group, led by CAPT David Racicot in December 1995, has validated this concept of operations.(8) The family physician as the primary care clinician is ideally equipped to gain patient access into the integrated multidisciplinary health care system for medical treatment, referral, and aftercare. Entry into the managed care arena is a natural for Navy family physicians, and it is expected that this specialty will pave the way for the Navy. A Primary Care Demonstration project recently approved for San Diego, led by CAPT Larry Johnson,

should help to validate the family physician as the specialist of choice in managed care.

What do these historical roots mean for the family physician? It means that we, in family medicine, accept the new challenge created by change and motivate one another proactively to lead Navy medicine to its destiny as the preeminent military health care system in the world. Family physicians are the natural choice and are well suited to do so into the 21st century. *Carpe futuris!*

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CDR Emerine is a staff family physician at the Family Practice Residency, Naval Hospital Camp Pendleton, CA, where he is the director for research and faculty development and a residency team leader. RADM Higgins is a former Deputy Surgeon General of the Navy and Chief of the Medical Corps, and past president of the American Academy of Family Physicians. He is presently the president-elect for the World Organization of Family Doctors and now resides in Anacortes, WA. RADM Frost is the Medical Director of the South Bay NAVCARE Prime Clinic in Chula Vista, CA. Dr. Frost retired from the Navy in 1996. CAPT Jeffries is Head, Family Practice Department, Residency Program Director, Chairman of the Executive Committee of the Medical Staff, and Director of Medical Services at Naval Hospital Camp Pendleton, CA.

ASAM: The New Wave in Navy Alcohol Treatment

CDR William L. Howell, MSC, USN
LT Drew C. Messer, MSC, USNR

The Alcohol Rehabilitation Department of the Naval Hospital Camp Lejeune, NC, has operated as a traditional 28-day inpatient system for several years. Although considered to be relatively effective—more than 70 percent of participants are reported as treatment successes at 18-month followup—the majority of the youthful personnel hospitalized at Camp Lejeune could be dealt with more effectively in a highly structured, individualized format with shorter length of stays.

In February 1994, plans began which were to eventually lead to a major consolidation of treatment resources at Camp Lejeune. This plan was a result of a site visit by CAPT Ralph Bally, MSC, from the Bureau of Medicine and Surgery (BUMED) and Mr. Jim McHugh and Mr. Dan Jenkins from Headquarters, Marine Corps (HQMC). The plan involved funding by HQMC for significant upgrading of the Alcohol Rehabilitation Department building, which is a large World War II barracks. The site visit was followed by multiple trips to Washington, DC, by the Director of the Consolidated Drug and Alcohol Center and the Head of the Alcohol Rehabilitation Department to negotiate the complicated agreement to fully consolidate resources.

On 11 May 1995, the Commandant of the Marine Corps issued a letter

endorsing the project and directing its implementation. The resultant plan required several months of building remodeling. The end product was a large complex with 38 offices, new telephone and electrical systems, upgraded computers, and new group and classroom spaces—all provided by UNICORS. A revision in the chain of command structure occurred in order to accommodate the consolidation of the Alcohol Rehabilitation Department and the Consolidated Drug and Alcohol Center (see Figure 1). The resultant codirector format required close cooperation and mutual trust for implementation.

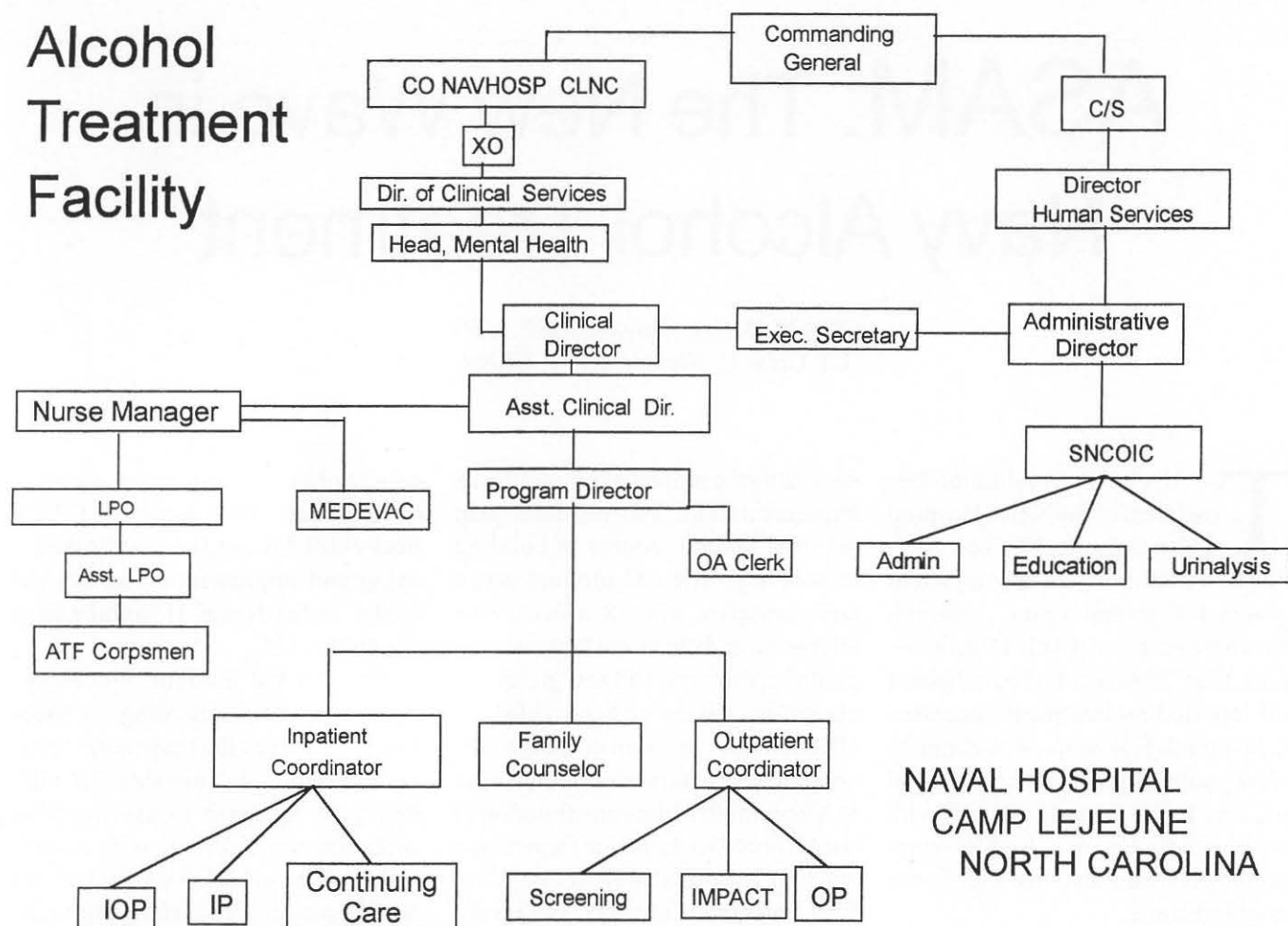
Following completion of the building upgrades and the arrival of multiple truckloads of furniture, the counseling staffs from the Alcohol Rehabilitation Department and the Consolidated Drug and Alcohol Center moved in together, resulting in a combined staff of over 50 personnel. Because the merger presented significant staffing issues, including learning new systems of communication and sharing of work load, Mr. Audie Brinker was brought into the facility as a consultant by HQMC to assist in integrating the staffs and to train them in the implementation of the American Society of Addiction Medicine's (ASAM) Patient Placement Criteria for the Treatment of Psychoactive Substance Use Disor-

ders.⁽¹⁾ Mr. Brinker was a member of the team that assisted CAPT Becky Gill, MC, and her staff in developing and implementing an ASAM model at the Naval Hospital Camp Pendleton, CA.

The ASAM Patient Placement Criteria model, according to Mee-Lee,⁽²⁾ replaces the traditional "program-based," or "one-size fits all," treatment approach to psychoactive substance use disorders with a clinically-driven model. The goal of the ASAM model is to match patients to levels of care and treatment modalities tailored to patient needs. Such an approach protects access to quality treatment and conserves health care resources.

The ASAM model developed at Camp Pendleton matches patients to treatment by matching severity of alcohol addiction with intensity of alcohol services. Seven dimensions are used to assess biopsychosocial severity: (1) potential for acute intoxication and/or withdrawal, (2) biomedical conditions and complications, (3) emotional/behavioral conditions or complications, (4) treatment acceptance/resistance, (5) relapse potential, (6) recovery environment, and (7) operational commitments. Criteria listed under these seven dimensions help guide placement to one of four levels of care: IMPACT (education), outpatient program (OP), intensive outpa-

Alcohol Treatment Facility



NAVAL HOSPITAL
CAMP LEJEUNE
NORTH CAROLINA

Figure 1

tient/partial hospitalization program (IOP), or residential inpatient program (IP).

The Camp Pendleton model did not integrate the residential inpatient system into the intensive outpatient system. It was therefore a significant leap forward for the Camp Lejeune program to also modify its residential inpatient system away from the standard 28-day approach and incorporate an individualized treatment approach. Figure 2 presents Camp Lejeune's treatment flowchart, which begins in the upper left-hand corner with the referral of the servicemember to the command SACO or DAPA. The far left column represents the initial screening process, where the ASAM criteria are applied and guide

placement of the servicemember into the appropriate treatment system—represented by the rows.

Individuals diagnosed as alcohol-dependent enter either: (1) the residential inpatient program, or (2) the intensive outpatient program. Chronic abusers can also be placed in the intensive outpatient program where they receive more advanced treatment, and where they can be closely observed to clarify their diagnosis.

The residential inpatient program consists of 2 weeks of full-time treatment (or more, depending on individual needs), and is identical to the first phase of the intensive outpatient program. Upon completion of the first 2 weeks of treatment, most individuals then begin the second

phase of treatment—which is again 2 weeks in length. Individuals meet three afternoons per week, and attend classes and groups which prepare them for relapse prevention and continuing care. Patients in the residential inpatient and intensive outpatient program are placed in the same treatment groups. Patients in the outpatient program, which meets half-days in the morning for 2 weeks, also share many classes with patients in the residential inpatient and intensive outpatient programs.

The progress of all patients, whether in the residential inpatient program, the intensive outpatient program, or the outpatient program, is monitored by the Interdisciplinary Treatment Team (IDT). The IDT reviews every

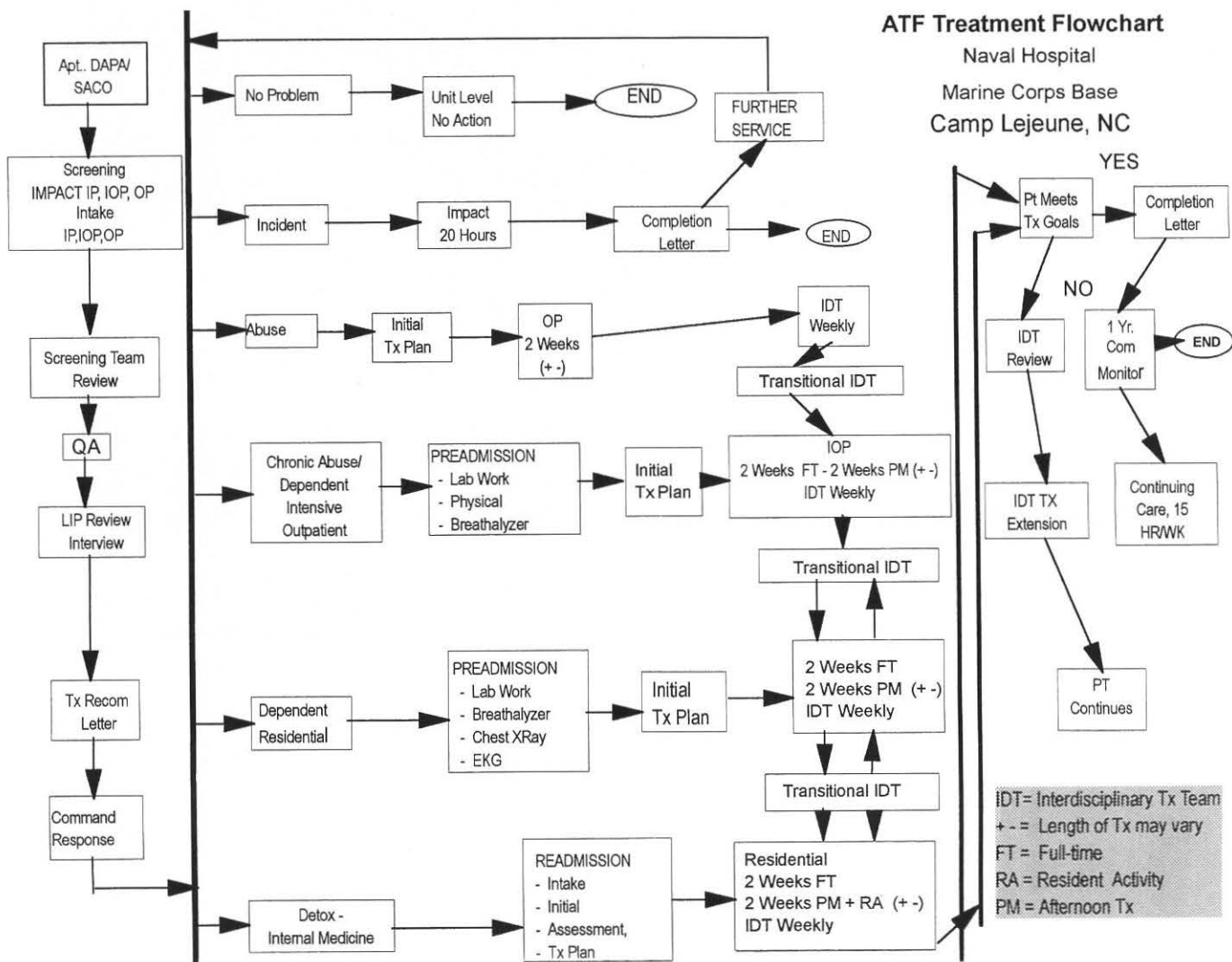


Figure 2

patient weekly in organized meetings, and makes decisions concerning modifications in individualized treatment plans. An interdisciplinary advisory committee also meets twice a month to review activities of the entire Alcohol Treatment Facility.

Finally, the traditional aftercare program was modified into a continuing care system which allows for selection of classes based on individual needs. This new approach allows for more rapid treatment turnover and quicker return to commands and duties while providing continued support to the individual. This is consistent with managed care principles and with

the concept of returning military members to duty as soon as possible.

In summary, following many months of cooperative efforts between the Navy and the Marine Corps, both at BUMED/HQMC and at Camp Lejeune, a complex consolidation of treatment resources was established. After the successful merger of the staffs, plans began to develop a new, more efficient approach to treatment management based on Camp Pendleton's model. The resultant ASAM-based comprehensive program provides multiple treatment options with maximum flexibility and increases treatment availability to larger

numbers of individuals. It provides for earlier return to military units and better meets the needs of the personnel and commands that we serve.

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When this article was written the authors were stationed at Naval Hospital Camp Lejeune, NC.

Surgery in the Park:

Echelon II Care at Its Finest

LTJG Reginald C. Brown, MSC, USNR
LCDR Michael R. Brantley, NC, USN



A left inguinal hernia repair was one of the surgeries performed during Surg Ex 1-97.

"We must do what we do with what we have."—CAPT Carl J. Hooton, MSC, Commanding Officer, 2nd Medical Battalion

With reductions in personnel and fewer assets available, Surgical Companies must show the ability to deploy in a organized and mobile manner. This can only be assessed through extensive training under combat conditions. A surgical exercise (Surg Ex) is the most efficient means by which to measure a Surgical Company's readiness and ability to contribute to mission accomplishment.

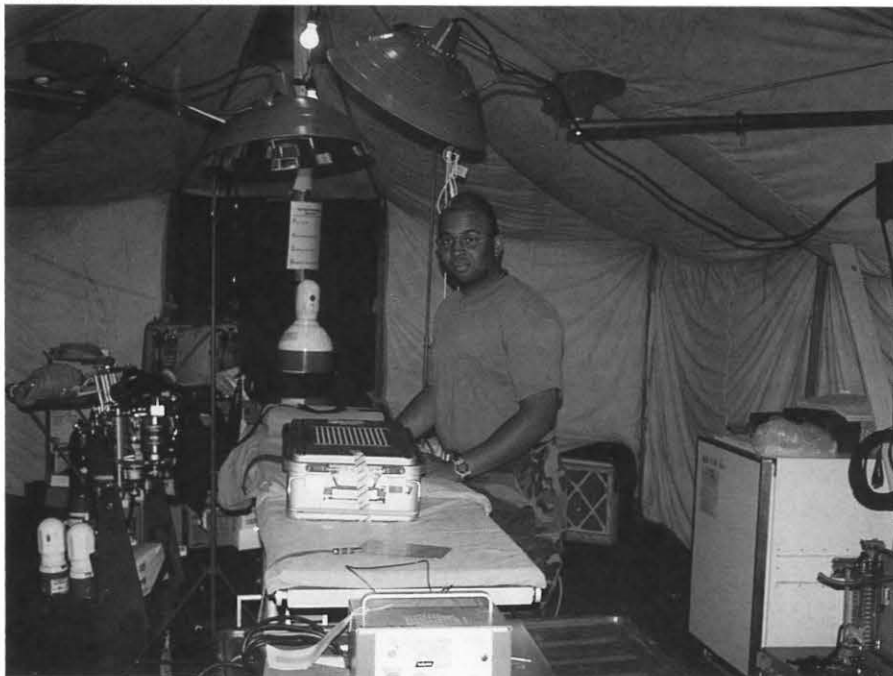
On 30 May 1997, Sailors and Marines from 2nd Medical Battalion, 2nd Force Service Support Group (FSSG), Marine Corps Forces Atlantic (MARFORLANT), Camp Lejeune, NC, and medical augmentees assigned to this platform, came together to demonstrate the true meaning of the word: capability. During Surgery in the Park (Surg Ex 1-97), it was proven once again that surgery in the field could be performed safely and in a sterile environment. The intent of a Surg Ex is to test the readiness of a Surgical Company under combat conditions. The 2nd Medical Battalion not only accomplished the intent, but also gained

real-world experience with the gear used in operational contingencies.

Surg Ex 1-97 placed emphasis on realistic training for members of 2nd Medical Battalion and augmentation personnel. This was done by performing the mission with equipment and supplies used in combat. CAPT Hooton stated, "If we have to go to war tomorrow, we must know how to use what we have, not what may be available in the future. This kind of training is, and must be, at the forefront of operational readiness."

Surg Ex 1-97, conducted 2-6 June provided 2nd Medical Battalion and its platform members with an opportu-

HM1 Osmel Alphonso, 2nd Medical Battalion



HM3 Christopher Williams, Charlie Surgical Company, inside a field operating room.

retrograde phases of the Surg Ex. This unique Surg Ex was a culmination of planning and coordination between 2nd Medical Battalion commanded by CAPT Hooton and Naval Hospital Camp Lejeune commanded by CAPT Donald Arthur, MC, dating back to December 1996.

The Surg Ex location was inspected by safety, infection control, environmental compliance, and other health care-related areas, before the go ahead was given to begin performing surgery in this field setting. These initiatives were carried out to ensure patient safety along with making everyone comfortable with the concept of Surgery in the Park. During actual combat, the Surgical Company is set up and as casualty flow allows, improvements to the facility are made. The Surgical Company does not operate on dirt floors unless there is no other choice.

nity to train and operate in the field environment. The Medical Battalion deployed Charlie Surgical Company (-). It included one ward, one operating room (OR), one X-ray, one lab, one pharmacy, and one central sterile supply and redistribution (CSSR) area. This is approximately one-half a Surgical Company's total capability. Charlie Surgical Company (-) was set up prior to D-Day on the lawn nearby Naval Hospital Camp Lejeune. The selected location provided ease of access for the patients arriving for surgery.

Eleven Medical Augmentation Personnel (MAPS) from Naval Hospital Camp Lejeune reinforced Charlie Surgical Company, bringing the total manpower strength to 62 officers and enlisted personnel in support of Surg Ex 1-97. Although sponsored by

Charlie Surgical Company, it was supported by the entire 2nd Medical Battalion. Representatives from training, administration, logistics, supply, engineers, and motor transport, were all actively involved in the predeployment, deployment, operational, and

HM2 William Holloman, Naval Hospital Camp Lejeune



HM3(FMF) Eric Irby, Charlie Surgical Company, briefs CAPT (RADM-select) Alberto Diaz, Medical Officer of the Marine Corps, and other VIPs on the Surg Ex CSSR capabilities.

Medical augmentees from Naval Hospital Camp Lejeune were given the opportunity of using the equipment they would use during a real-world scenario in the field. Surgeons from Medical Battalion and the hospital screened their active duty population and selected 14 suitable minor surgery patients. The elective surgeries consisted of vasectomies, excisions of lipomas and moles, and an inguinal hernia repair. Although this is the fourth Surg Ex for 2nd Medical Battalion, the hernia repair was the first in a field OR.

The entire exercise was conducted over a 5-day period and included tours by VIPs and other interested parties. Among the VIPs was the Medical Officer of the Marine Corps, CAPT (RADM-select) Alberto Diaz, who stated, "I am very impressed that your patients felt confident and secure enough to volunteer to have surgery done." BG Harold Mashburn, Commanding General, 2nd Force Service Support Group, who toured the facility twice, stated, "this is great training. We need to keep doing this."

For most, it was their first hands-on experience with a Surgical Company. Additionally, for many, it was their first experience with health care delivery in the field with the Fleet Marine Force (FMF). LTJG Dayton Huebner, a Nurse Corps officer from Naval Hospital Camp Lejeune, after completing this week's exercise, said, "there was virtually no difference from the ward at the hospital. There was no drop in safety, and everything was well covered." On the other hand, some of 2nd Medical Battalion's personnel had participated in past surgical exercises. Petty Officer Christopher Williams, an OR technician attached to Charlie Surgical Company, added, "This is my third surgical exercise and it amazes me how everything comes together. It makes me

feel good to tell others like the Medical Officer of the Marine Corps what we can do. Navy medicine is the best medicine."

Gaining the respect and confidence of the physicians and other augmentees involved is very important to the success of a field Surg Ex. CDR Francis MacMahon, MC, 2nd FSSG Group Surgeon, who functioned as the anesthesiologist, commented on Surg Ex 1-97. "This exercise provides a great training opportunity for Medical Battalion and its augmentees."

LCDR David Sechler, 2nd Medical Battalion General Surgeon, was confident the surgeries would be completed safely. He believes "flexibility is the key. There are things that are not going to go perfectly smooth, generators go down, lights flicker." He went on to say, "These are conditions you have to get used to because this is what we have to deal with in the field when we are actually operating under battle conditions."

Hospital corpsmen are trained in field medicine and look forward to putting that training into practice. Petty Officer Jody Thomas, an OR technician from Naval Hospital Camp Lejeune, remarked, "We basically have everything we would have in a regular hospital OR." The 2nd Medical Battalion also has a complement of Marines who provided engineer and motor transport support during Surg Ex 1-97. These Marines were amazed at the capability of the Surgical Company to actually perform surgery in the field. "This gives me more respect for them, to see that they can come out here in a field environment without all the sophisticated equipment they use in a hospital and actually do surgery," said CPL Timothy McIntosh, an engineer from 2nd Medical Battalion.

An unexpected benefit of the exercise was the apparent comfort level the Surg Ex provided to the Marines,

Sailors, and Coast Guard personnel who volunteered as patients. The patients appeared confident and ready for surgery. The first surgical patient, Petty Officer Travis Capps from the Coast Guard Marine Safety Office, Wilmington, NC, stated, "Everyone here was very helpful and put my mind at ease."

The Commanding Officer of 2nd Medical Battalion has the distinction of being the first patient to have a hernia repair during a Medical Battalion Surg Ex. He remarked, "Unlike Motor Transport Battalion, we don't fix trucks on a daily basis. The only time we get to take care of patients is if they get wounded." CAPT Hooton went on to say, "There is no place in the Navy that I would get better care than I would right here."

Surg Ex 1-97 was a tremendous success, resulting in valuable training for all involved. Patients, staff, and visitors were pleased with the operation and surprised by the capabilities and cleanliness of the facility. This Surg Ex, and future exercises like it, are invaluable in preparing Navy and Marine personnel for future operations. The opportunity to work together with the equipment they will use in the field under combat conditions will have significant benefits when that time comes. Training with the equipment available during combat is the only way to ensure true readiness. The Fleet Marine Force deserves nothing less. □

LTJG Brown is Company Commander, Charlie Surgical Company, 2nd Medical Battalion, 2nd Force Service Support Group, Marine Corps Forces, Atlantic, Camp Lejeune, NC. LCDR Brantley is the organization's S-3 officer.

"Like a Family Reunion": Hospital Corps Medal of Honor Recipients Attend Conference

HMCS(FMF) Mark T. Hacala, USNR

"We've been to numerous events where they've rolled out the red carpet for us," said former hospital corpsman and Medal of Honor recipient Donald Ballard. "But this was different. This was like a family reunion."

All four living Hospital Corps Medal of Honor recipients attended the 1997 Surgeon General's Leaders Conference in Arlington, VA, 25-29 August. Donald Ballard, Robert Bush, William Charette, and George Wahlen were invited to participate in the event which brought together senior Navy medical personnel from around the world.

Bureau of Medicine and Surgery Force Master Chief, HMCM(SS) Michael Stewart, wanted the four recipients to attend the conference as a motivation to the Medical Department's senior enlisted leaders. "We have four living legends," Stewart said. "By having them here, I knew that we were really focusing on readiness and what it means to Navy medicine. Who could better articulate readiness than four gentlemen who lived through combat and could inspire us all?"

Each of the former hospital corpsmen received the Medal of Honor for heroism in combat with Marine Corps infantry units. George Wahlen, as a pharmacist's mate second class, received the medal for service on Iwo Jima. Hospital Apprentice First Class Robert Bush's actions on Okinawa in 1945 were recognized by the decoration as well. William Charette, then a hospital corpsman third class, was decorated for valor in Korea in 1953. Donald Ballard displayed gallantry as a hospital corpsman third class in Vietnam in 1968.

Ballard, Bush, Charette, and Wahlen attended presentations covering the scope of Navy medical care during the 5-day conference. Each spoke to the enlisted group, recounting their experiences in relation to the conference theme of mission readiness.

"I really enjoyed it," said George Wahlen, who retired from the Army as a Medical Service Corps major. He was impressed with current Navy capabilities and professional attitudes. "It was more positive than I imagined, not just Navy medicine but the Navy in general," he remarked.

A career Sailor, who retired as a master chief hospital corpsman (submarine service) in 1977, William Charette was impressed with the professional aspects of the conference. "I was amazed at how much information was passed and how much could be

used when they got back to their commands," Charette commented. "It was completely different from anything I witnessed when I was in."

The medal recipients were special guests during opening ceremonies and at the conference's Tuesday evening reception. They were also the guests of honor at the Chief Petty Officer Dining In on Thursday evening, along with the Surgeon General, VADM Harold M. Koenig, MC, and Master Chief Petty Officer of the Navy, ETCM(SW) John Hagan.

VADM Koenig noted that the attendance of all four living Medal of Honor recipients was fortunate for those who came to the conference. "It truly was inspiring to have these four heroes attend the conference," Koenig said.

Master Chief Petty Officer of the Navy Hagan said he felt privileged to share the same table with awardees and the Surgeon General. "It drove home the feeling that the hospital corpsman rating," especially those with the Fleet Marine Force, "is a particularly proud group with a wonderful heritage forged in many hazardous and heroic actions. The hospital corpsman rating badge represents this heritage and truly symbolizes our core values," MCPON Hagan remarked.

Ballard, Bush, Charette, and Wahlen took time to meet the senior enlisted and officers throughout the conference. In addition, attendees brought their commands display photos of the Medal of Honor recipients, which the four autographed during the week.

Robert Bush was pleased that all four awardees could attend. "It was wonderful to have them there to participate in the conference and to sit in on the dialogue among the chiefs," Bush said. "I found it especially enjoyable to share the camaraderie and to see the interest in Navy medical history."

Don Ballard, a colonel-select in the National Guard, has spoken before a variety of groups, from Army generals to grade school students. "For this I actually got a little nervous," he said. "I wanted to try to inspire this group even more because they were Navy hospital corpsmen." □

HMCS(FMF) Hacala is currently assigned to the office of the Force Master Chief Petty Officer (MED-00HC), Bureau of Medicine and Surgery, Washington, DC.

Navy Medicine in Hunter Warrior, 1997

Neil Carey, Ph.D.
LT Lee Kiolbasa, MSC, USNR

As the Mobile Trauma Team arrives at the site of injured Marines, a corpsman pulls out his holstered Newton personal digital assistant, inserts each Marine's identification card, extracts critical medical data, and, after initial treatment, enters primary diagnosis and treatment information. He then requests medevac via the Newton-Ericsson communicator which automatically relays Global Positioning System (GPS) location and casualty evacuation information digitally to the Combat Service Support Operation Center (CSSOC) over the horizon. The CSSOC receives the message on its shared net medical evacuation screen, and dispatches the nearest Medical Contact Team to evacuate the casualties. Is this the year 2010? No, it's March 1997—the date of Hunter Warrior, an exercise taking place at Camp Pendleton and Twentynine Palms, CA, which included Navy medical personnel.

The Navy medical personnel just described were attached to the Medical Detachment of Combat Service Support (CSS) Enterprise, the Combat Service Support

Element of a Special Purpose Marine Air Ground Task Force Experimental, SPMAGTF(X), which was established by the Commandant's Warfighting Lab. The Commandant's Warfighting Lab, located in Quantico, VA, is responsible for developing advanced warfighting concepts and supporting technologies to lead the Marine Corps into the 21st century. To carry out this mission the Warfighting Lab established a SPMAGTF(X) at Camp Pendleton, to support the first phase of a 5-year experimentation process to evacuate advanced warfare concepts and technologies. CSS Enterprise is assigned to develop and test new concepts and technologies for combat service support. Advanced Warfighting Experiment, Hunter Warrior, the first phase of the Warfighting Lab's 5-year experimentation process, was an exercise in which SPMAGTF(X) forces were inserted from over the horizon into a battlespace at Marine Corps Air Ground Combat Center, Twentynine Palms.

Many of the Lab's concepts are based on the maneuverability of smaller, lighter, more independent, and mobile

warfighting units, often operating behind enemy lines. These warfighting concepts complicate the task of providing medical support by severely limiting or eliminating fixed medical facilities ashore, by making it more difficult to locate casualties, and by endangering the evacuation process. In some cases, casualties might not be safely moved for up to 24 hours, while waiting as far as 200 nautical miles from the first surgical support on amphibious ships, such as an LHA.(1,2)

In developing a medical concept of operations to support Hunter Warrior, CSS Enterprise Medical Detachment had to consider new ideas and supporting technologies for: (1) casualty care, (2) information systems, (3) medical resupply, and (4) education and training.(3) Other CSS technologies tested included: (1) mobile medical platforms, (2) experimental delivery systems, (3) mobile monitoring equipment, and (4) experimental power systems.

Casualty Care

Initial casualty estimates for the scenario were prepared for CSS Enterprise by Naval Health Research Center (NHRC), San Diego, CA, Operations Research Department using the FORECAS medical casualty fore-



From left to right: LCPL Americo Garcia, HM3(FMF) Rodrigo Adriano, HM2 Joe Fiscus, HN Gerald North, HM3(FMF) James Wallace, and Medical Detachment Commander LT Lee Kiolbasa are prepared for a casualty extraction during Hunter Warrior.

Figure 1
The CSS Command and Control System is an integrated and automated system designed to reduce combat service support footprint and inventory in the field.(4)

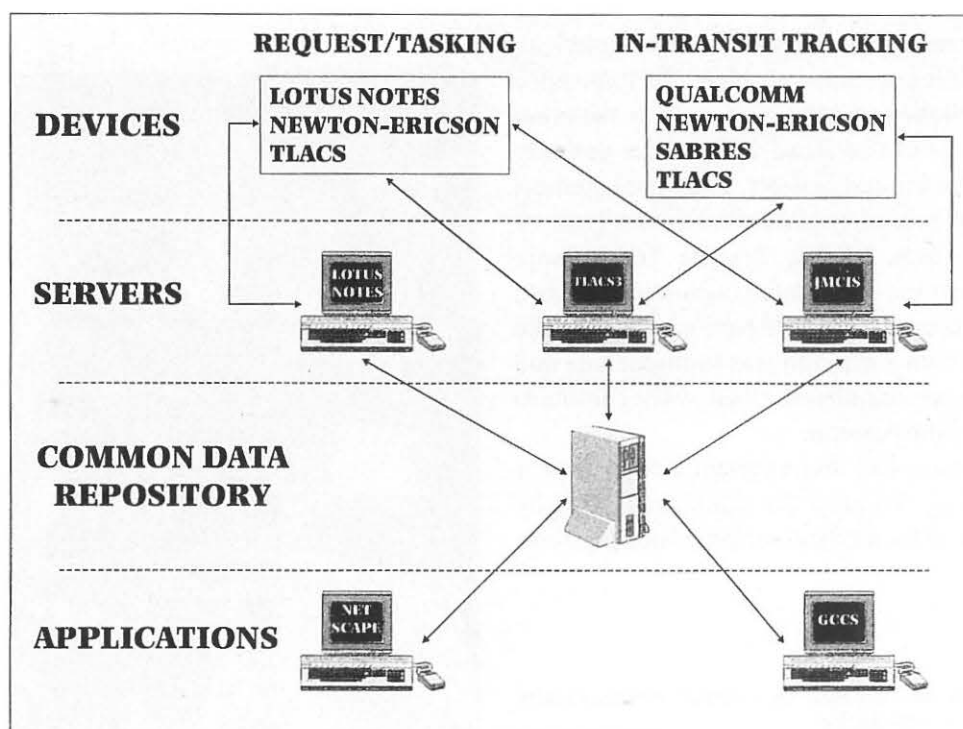
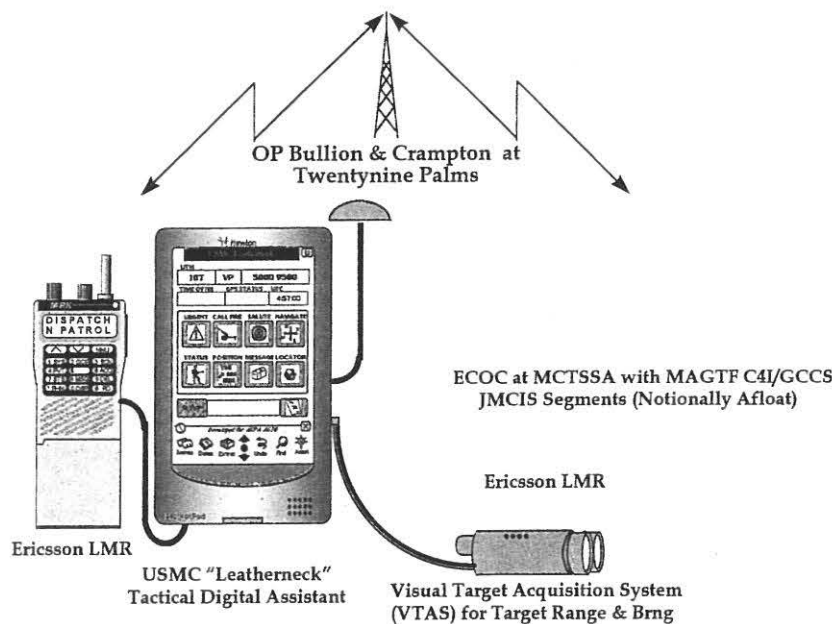


Figure 2

The Newton-Ericsson communications system uses off-the-shelf hardware, including the Apple Newton touch screen computer and Ericsson radio.(4)



Hand-held touch screen computers were used to read Multi-Technology Automated Reader Cards (MARC) during casualty extraction.



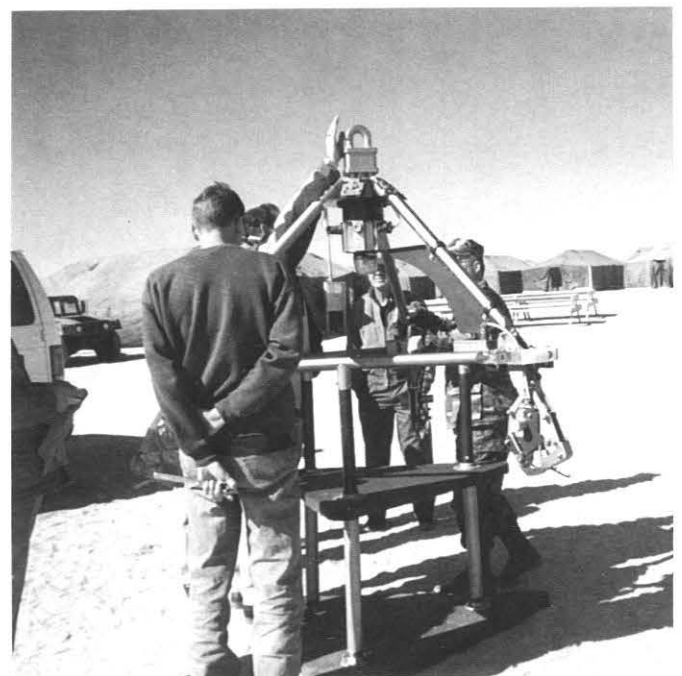
casting model.(4) The model was run for a 30-day period for a 2,000-member, MEU-sized MAGTF, engaged in a variety of combat intensities. Climate and terrain factors were also taken into consideration. Wounded in action casualty estimates ranged from 8 minimum to 26 maximum daily presentations.

To best support this scenario medically, with the resources available, our concept of care was to include corpsmen with the small teams dispersed on the battlefield, and with the operational maneuver elements to provide care to patients until they could be evacuated. In the event that the corpsman would be faced with a mass casualty situation, or become injured himself, additional medical support would be provided by a Mobile Trauma Team or Medical Contact Team. Mobile Trauma Teams were developed to support the operational maneuver element, maintaining patients until they could be evacuated, and the Medical Contact Team's mission was to resuscitate and evacuate patients by air, maintaining them while enroute to follow-on care over the horizon.

Information systems had an important role in Hunter Warrior medical play. To meet the challenges posed by more maneuverable units, medical personnel need systems

to help them maintain situational awareness in the field, to track casualties, to order medevac, and to order medical resupply.

The CSS Command and Control System developed by CSS Enterprise contains many features that were employed to advantage in addressing the needs of health service support. The CSS Command and Control System



The Skyhook allows helicopters to release electronically multiple deliveries in one sortie.

(see Figure 1) is an integrated and automated system designed to reduce CSS footprint and inventory in the field. Concepts of the system, which served as the hub for the entire operation, included the Newton-Ericsson Communications System, the Rapid Request Tracking System (RRTS), and the Tactical Logistics Automated Combat Service Support System (TLACS-3).

The Newton-Ericsson communication system (see Figure 2), developed by Booz Allen and Hamilton for concept testing purposes, uses off-the-shelf hardware, including the Apple Newton touch screen computer and Ericsson radio. Information is logged into the Newton and digitally transmitted over the Ericsson radio. The Newton has screens to call for fire, send free text messages, and order supplies, and a "situational awareness" screen that shows the positions of other units on the battlefield. Screens were added to request medevac and order medical supplies. During exercise play, personnel successfully transmitted requests for medevac and ordered medical supplies with the Newton.

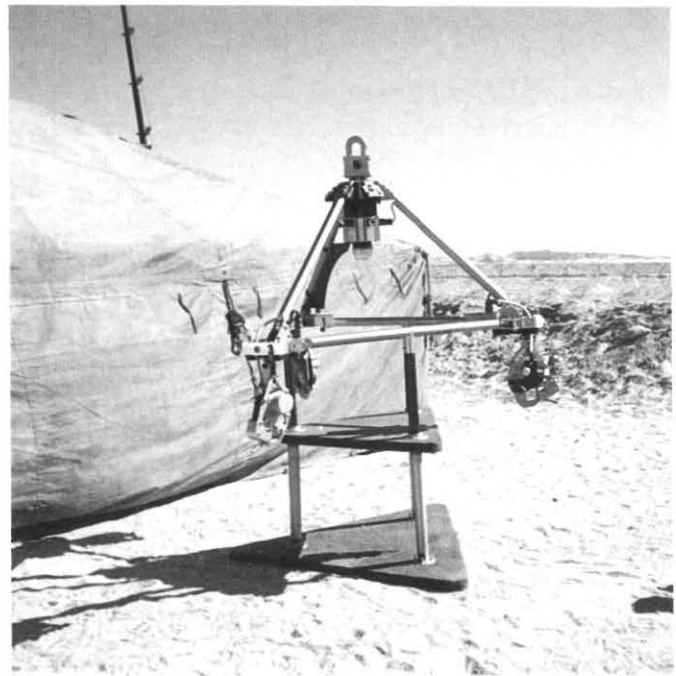
Another component of the command and control system, the TLACS-3, was developed by SRI International as one of the first-ever digital CSS planning tools. It is similar to the Newton because it employs a computer and the Ericsson radio, and it has a situational awareness piece that keeps track of all units in the field. In addition, mission routes and alternative courses of action can be drawn on it; it has free text capabilities and pop-up menus that give equipment, supply, and personnel information for each

unit. CSS Enterprise Medical Detachment used the system for medical mission planning and it worked well.

In addition, the Multi-Technology Automated Reader Card, or MARC, was employed to facilitate patient movement and for personnel processing. Each member of SPMAGTF(X), over 2,000 individuals, were issued MARCs with their personnel and medical readiness data stored on a 2K chip on the front of the card. Hand-held touch screen 486 computers were used to read stored medical readiness information and to record patient treatment information on the MARC.

The shipboard accountability program was used to track over 600 personnel for 3 months at the forward logistics ship site in Twentynine Palms. Personnel entering or leaving the area scanned their cards and the program placed them in the appropriate in or out log. The program reports function generated alphabetical lists of everyone on board or checked out at a given time, and these lists were used for daily accountability reports. A similar manifesting program was employed to create manifests of teams deploying to the field by scanning their cards.

Normally, medical resupply of corpsmen in the field is accomplished through their parent aid stations, but in Hunter Warrior without traditional medical resources ashore, alternate methods of resupply had to be developed. For this purpose medical resupply was integrated with the CSS Enterprise RRTS as part of the CSS Command and Control System. The RRTS provides total asset visibility and tracking. Employing RRTS, each detachment main-



CNA analyst Dwight Lyons and a Marine record data on location and condition of a GPADS drop.



tained a data base of personnel, equipment, and supplies, and all equipment and supply requests were submitted and traced through the RRTS.

The RRTS freed personnel from having to walk with paper forms to supply, and let them check order status immediately. Whereas the old paper-and-pencil system made it difficult to verify that an order was in the system, the RRTS facilitated tracking an order electronically. The system has three advantages: it lowers anxiety about whether supplies will be received, allows medical to travel with fewer materials, and discourages multiplicative, redundant ordering.

Education and Training

The limited medical presence ashore and tactic of operating in smaller teams made it necessary to place a heavy emphasis on medical skills training for both corps-



men and Marines. Two education and training initiatives tested were the MERLIN triage trainer and Combat Lifesaver Training. The MERLIN, or Medical Readiness Learning Initiative Trainer, was funded by the Office of the Assistant Secretary of Defense for Reserve Affairs, and developed by the Uniformed Services University of the Health Sciences (USUHS) and the Jackson Foundation for the Advancement of Medicine. The MERLIN presents students with video clips of casualty scenarios, prompts them to place the injury in a triage category using the mouse, and then gives them feedback on how well they did.

MERLIN was field tested at CSS Enterprise and at the Field Medical Service School, Camp Pendleton, to teach basic triage skills to both corpsmen and Marines. Results from pre- and post-tests and field practical exams showed that both groups did very well. Overall, students were found to be very receptive to this form of learning, and followup testing is being done to assess retention levels.

Nine 1-week Combat Lifesaver Courses were taught by the Ground Combat Element to teach basic lifesaving skills, including CPR, to 187 Ground Combat Element Marines. All passed written tests and field practicals with average class scores ranging between 83 percent and 90 percent. A 2-day refresher course is being taught and data on retention levels are being gathered.

Another product developed was the Mobile Medical Station. Two vehicles were funded for this project as combination command-and-control and medical vehicles on the premise that many of the requirements for command and control (e.g., power, light, heating, cooling, and com-



Hunter Warrior tested the output and reliability of the Mobile Hybrid Power Plant.

munications) can also be used for medical purposes. The vehicles are high-back HMMWVs with additional storage space added. The back was raised to provide more head room, and a pull-out tent was added on the back of the vehicle to allow for more working area. Inside the vehicle, there is a modular cube in the back that has power outlets and contains medical equipment items and supplies. It is removable, so if the vehicle becomes disabled the medical capability can be transferred. A casualty can be placed on a pull-out litter or on a treatment table which folds out from the cube lid.

The Mobile Medical Station was successfully deployed in an exercise where the M(3A) Mobile Medical Monitor was tested for NHRC. The project is continuing to be funded and the vehicles are with the contractor in San Diego undergoing additional modifications. Another concern of medical in the field is how to receive medical resupply behind enemy lines. Several systems designed to meet this challenge were tested at Hunter Warrior. The Skyhook (see photos) allows a helicopter to take multiple loads that can be electronically released independently, eliminating the necessity of a single sortie for each load; total system capacity is 27,000 pounds.

The Guided Parachute Air Delivery System (GPADS) delivers to a preprogrammed grid coordinate using GPS, carrying up to 2,500 pounds. It can also be programmed to fly to a beacon, and it can be delivered from a helicopter or a C-130. Delivery of medical supplies via GPADS was tested, and medical supplies, including I.V. bags, were delivered without damage to within about 100 meters of a programmed location.

Even in the field, medical personnel need power sources for light and to operate equipment. Unfortunately, fossil fuels are heavy and require significant resources to transport. Therefore, Hunter Warrior tested novel power sources. A windmill/solar energy system was used to run some of the administrative tents at Twentynine Palms. The photo below shows a solar panel used to recharge a battery capable of powering portable radio equipment, thus elimi-



Portable solar panels were used to recharge communication batteries in Hunter Warrior.



A remote monitoring/maintenance communications system was used to monitor the status of vehicle operating parameters.

nating the need to carry the extra weight of batteries to replace nonrechargeables.

With a small team behind enemy lines, it is particularly dangerous to have transportation equipment break down. Therefore, a remote monitoring/maintenance system was also tested during Hunter Warrior. A monitoring system developed by Science Applications International (SAIC) was carried in land vehicles to monitor vehicle operating status. The unit sent information to mechanics in the rear concerning the vehicle's temperature, RPM, and battery charge. Data such as these can be used to diagnose and predict equipment failure, or required maintenance, *before* a problem occurs behind enemy lines.

Conclusions

Many of the technologies tested in Hunter Warrior showed promise and will continue to be employed and refined. Further systems testing is taking place in the 11th Marine Expeditionary Unit (MEU), based in Camp Pendleton. In addition, many of the systems tested are being expanded upon by the Commandant's Warfighting Lab, as it develops technologies to support Urban Warrior, the next phase in the Lab's 5-year experimentation process. Based on the results of the experiments carried out in Hunter Warrior, fleet operational needs statements will be submitted to the Marine Corps Combat Development

Command (MCCDC). More in-depth information is available from the CSS Enterprise After Action report to be distributed in the near future.

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Dental Team's Role in Tobacco Cessation

CDR Larry N. Williams, DC, USN

Part I: Role of the Dental Team

Tobacco has been identified as a major risk factor associated with many forms of dental disease. The dental team must be prepared to affect this risk factor to help prevent future disease. Obviously, the role of the dentist in tobacco cessation, although relatively new, is very important. With the advent of Nicotine Replacement Therapy (NRT) being available over the counter, the dental professional will now need more knowledge of these medications both to help their patients quit and to answer any questions as to the proper use of these medications. This new availability will also mean that dental professionals can also incorporate both tobacco cessation advice and NRT as part of their preventive message to patients wishing to quit.

To facilitate the dental team's role in tobacco cessation, this article will cover the unique opportunity dentistry has in helping patients quit, background in the significant health risks of tobacco use, dental concerns regarding tobacco, the types of NRT currently available, and avenues of cessation advice/therapy.

You may ask why the military dental team should be involved in tobacco cessation? As mandated by current Navy directives, we are required to see our patients annually for an examination. Additionally, we are also now required to discuss, as well as document, tobacco cessation counseling with each patient that states a current history of tobacco use. The regulations state that we need to inform the patient of the hazards of tobacco use, benefits of quitting, where to get cessation help and, if pregnant, the hazards of tobacco use on the mother and fetus.

One key advantage of the dental team's involvement centers around our emphasis on, and provision of, preventive services. A message to each tobacco user of the oral health risks associated with tobacco use can sometimes have a greater impact than discussing overall health risks. The dental professional has the advantage of being

able to actually show the tobacco user the recession and leukoplakia associated with smokeless tobacco use, the overall staining of the tobacco user's mouth, the damage to anterior composite restorations due to the heat and staining of smoked tobacco, the results of the smoker's "dry mouth" which often results in cervical lesions and secondary caries and, of course, the associated periodontal disease which often results from the oral abuse of tobacco users. We have a distinct advantage over the medical community because these oral signs of tobacco damage are often present before the first heart attack or sign of cancer. By helping our patients quit, we can actually show them a short-term positive reward by demonstrating the beneficial effects of their cessation efforts in their oral cavity.

The amount of cessation help we are willing and able to offer our patients depends on the time available, the level of training of the provider, and the motivation of the patient. While not all health care providers are able to provide organized cessation clinics for their patients, studies have shown that a short intervention message delivered during the appointment can have a very beneficial effect (up to 5 percent). Additionally, studies have also shown that NRT alone can have a 10 percent quit success, behavior modification a 20 percent cessation success, and the combination of NRT plus behavior modification can have greater than a 30 percent rate of cessation success. Depending on the level of change and lifestyle that the potential quitter is in, the success can vary according to the quitter's motivation and determination.

Current Navy policy, as stated before, requires us to inform our patients of the hazards of tobacco use, the benefits of quitting, and where to go for cessation help. This information can be as brief or as lengthy as the provider wishes to provide time for in their practice. The dental team has the unique opportunity to provide a message to the patient while delivering dental care. *This message must be in a positive, upbeat manner with the*

patient encouraged to continue to think about quitting in the near future. If the patient states a desire to get help in quitting, the dental team must be prepared to offer referrals for cessation help. Current guidelines state that the health care provider should Ask, Advise, and Assist the tobacco user in their quit. If the patient states that they do not want to quit, the dental team should help the patient identify reasons to quit and identify any barriers that are hindering the quit.

Part II: Tobacco Hazards

The current emphasis on tobacco in the news has brought forth a great deal of information regarding tobacco hazard information. The following information is provided to allow the dental provider to develop a message to give their patients about the hazards of tobacco use. This message should not be only "raw scientific data," but should be presented in a positive, upbeat message geared to motivate the patient to quit their tobacco habit. Every member of the dental team—assistant, hygienist, receptionist, etc., should be involved in this message.

Chemistry

The chemistry of tobacco shows that there are more than 4,000 known chemical compounds present in tobacco—60 compounds are known carcinogens, tumor initiators, and tumor promoters such as hydrocarbons (tar), cyanide, phenols, benzene, nitrosamine(s). In addition, the tobacco plant concentrates two naturally occurring radioisotopes, radium and polonium, in its leaf. And, of course, we can't forget the addictive chemical in the tobacco product—nicotine. Nicotine has been shown to be as addictive as certain opiate medications and can produce withdrawal symptoms during the early part of tobacco cessation.

Epidemiology

Currently there are 1.1 billion smokers worldwide with developed countries having 41 percent of males and 21 percent of females using smoked tobacco. It is interesting to note that in developing countries 50 percent of the males while only 8 percent of the females smoke tobacco. Presently there are 3 million deaths per year worldwide contributed to tobacco use with smoking causing 20 percent of all deaths in developed countries. At current rates, someone dies every 10 seconds from smoking-related disease with trends showing 10 million dying per year by 2020. It is also interesting to note that China faces 2 to 3 million deaths per year due to tobacco use which equates

to 50 million Chinese alive today will die prematurely due to tobacco use by the year 2020. Current statistics show there are 50 million smokers in the United States with a resulting 400,000 tobacco-related deaths each year. Since one in five deaths in the United States is tobacco related, this figure (400,000) accounts for 20 percent of the U.S. mortality.

Youth

Sadly, 3,000 U.S. teens become regular smokers each day with 90 percent of new smokers being under the age of 18. While only 17.2 percent of high school seniors smoked in 1992, this figure rose to 21.6 percent in 1995. Additionally, it has been found that while 1.5 million adults *quit* each year, 1.5 million teens *start* each year. This number will only continue to grow if, as studies have shown, 73 percent of underage youth continue to be able to purchase tobacco products. It is sad to note that studies have also shown that certain tobacco advertising characters are more well known among elementary school students than Mickey Mouse.

Smokeless Tobacco

Studies on smokeless tobacco (ST) have shown that two-thirds of male high school seniors have tried it with the highest use in rural areas with the majority having tried it first in grade school.

Due to the thickness of the oral mucosa, there is a 30 percent rapid absorption through oral mucosa which results in increased heart rate and blood pressure. Studies have shown ST can produce additional carcinogens when combined with saliva. Statistics show that 91 percent of oral cancer patients have used smokeless tobacco.

Tobacco and Cancer

In regard to tobacco and cancer, tobacco use is the single major cause of cancer mortality in the United States and single most important environmental hazard. Smokers are ten times more likely to develop lung cancer, and female smokers have a three to four times greater risk of breast cancer. With the increase of long-term female smoking in the United States, lung cancer among women has now passed breast cancer as the leading form of cancer in women. While it is interesting to note that the biggest scare among smokers is the risk of lung cancer, the smoker is three times more likely to die from heart attack or stroke due to tobacco use. Other major tobacco-related diseases are lung cancer, COPD, emphysema, and coronary artery disease. Smoking costs the United States \$50 billion annually in health care costs alone.

Pregnancy

Tobacco use during pregnancy has been linked to sudden infant death syndrome (SIDS), placenta abrupta, spontaneous abortion, and nicotine dependence in offspring. Nicotine has been shown to be a neurotoxin to the fetus, and the fetal levels of nicotine have been shown to be higher than the mother's levels of nicotine. It has been shown that smoking can cause a decrease in fertility among both males and females. The use of NRT in pregnancy can be hazardous with the nicotine transdermal patch now being *Category D* during pregnancy (used only under strict observance by OB/GYN with the mother's life at risk) and the nicotine gum being *Category C* (less strict guidelines by OB/GYN).

Depression

Studies indicate that there is a 4-to-1 ratio of depression in smokers with the effect being more pronounced for females. In addition to depression, depending on the monthly cycle and other factors, women have been shown to have more trouble quitting than men. Current data shows that people quitting their tobacco use may require adjunctive therapy with mood elevators and antidepressants such as Elavil and Prozac. Some studies have found a 20 percent rate of major depression after cessation.

Secondhand Smoke

Secondhand (passive) smoke is harmful and has been classified by the Environmental Protection Agency as a Class 1 carcinogen. The American Heart Association (AHA) states 37,000 to 40,000 die annually from secondhand smoke in the United States. The Centers for Disease Control has found the secondhand smoke from smoked tobacco linked to approximately 3,000 lung cancer deaths each year in the United States. Each year in the United States, 4 million children are reported sick (middle ear infections, asthma, bronchitis) due to secondhand smoke.

Oral Cavity Effects

The effects of tobacco on the oral cavity can vary from simple staining, tooth loss, and regenerative failures, to the ravages of oral cancer. Tobacco has a role in the prevalence and severity of periodontal disease and increased tooth loss. Recent studies conclude that tobacco users have greater bone loss, increased number of deep pockets, and increased calculus formation. Current and former tobacco users constitute the most prevalent treatment groups in U.S. periodontal practices. The severity of periodontal disease is directly linked to both the amount and

the number of years of tobacco use. Tobacco use adversely alters response to periodontal therapy with smokers showing (postsurgical) deeper post-therapy probing depths and less gain in attachment.

Smokers have a poorer success rate for soft tissue graft procedures, bone graft procedures, and implants. Tobacco use plays a significant role in refractory periodontitis with tobacco users having a 90 percent refractory rate compared to nontobacco users having only a 30 percent refractory rate. Additionally, there are studies currently being done to see if NRT interferes with post-therapy healing.

Part III: NRT Medications

Since many of our patients are tobacco users and may be trying to use NRT to help with their tobacco quit, we as health care providers must be aware of any medications that our patients are taking and possible adverse side effects that may occur during or subsequent to dental treatment. Additionally, we may desire to help our patients with their planned tobacco cessation by prescribing NRT.

Current available transdermal delivery systems include: HABITROL™ (nicotine transdermal therapeutic system: systemic delivery of 21, 14, or 7 mg/day over 24 hours—Basel Pharmaceuticals); NICODERM® (nicotine transdermal system: systemic delivery of 21, 14, or 7 mg/day, over 24 hours—Hoechst Marion Roussel, Inc.); NICOTROL™ (nicotine transdermal system: systemic delivery of 15, 10, or 5 mg/day over 16 hours—McNeil Consumer Products); and PROSTEP™ (nicotine transdermal system: systemic delivery of 22 or 11 mg/day over 24 hours—Lederle).

Another source of NRT is the nicotine gum. NICORETTE® (nicotine polacrilex—SmithKline Beecham Consumer Healthcare L.P.) and NICORETTE® DS (DOUBLE STRENGTH) (nicotine polacrilex—SmithKline Beecham Consumer Healthcare L.P.) are also available over the counter. This gum contains nicotine bound to an ion exchange resin in a sugar-free flavored chewing gum base that provides systemic delivery of nicotine following chewing.

The Nicotine Nasal Spray, awaiting approval by the Food and Drug Administration, will be provided in a applicator with 10 mg of nicotine per ml. The dosage will be 0.5 mg per nostril with one to two doses per hour. This spray will only be absorbed in the nasal mucosa and is not to be inhaled. The adverse reactions are similar to other NRT products with the exception of the potential for nasal

and pulmonary complications. Other NRT medications may include a nicotine "lollipop" to be used ad lib. One important note to add is the fact that there is no increased health risk with NRT when compared to using tobacco.

As health care providers, we must be aware of the warning signs of nicotine overdose. Signs of nicotine overdose include headache, dizziness, abdominal pain, drooling, nausea, vomiting, diarrhea, cold sweat, blurred vision, difficulty hearing, mental confusion, weakness, and fainting. Symptoms of severe overdose include tremor, respiratory failure, low blood pressure, and prostration. If patients state that they are using NRT, the dental team can help remind the quitter that they must not use tobacco while using NRT.

For best results, the use of these medications should be tailored with a behavioral modification program. It should also be noted that these medications are contraindicated in certain medical conditions, and for those under 18 years of age. The indications, use, and contraindications of NRT use can be found in the Physician's Desk Reference or from manufacturers' package inserts.

Conclusion

The dental team does indeed have a unique opportunity to help patients recognize the hazards of tobacco use, the benefits of quitting, and where to go for cessation help. By incorporating a brief, positive, cessation message during the dental visit, the dental team has the potential to positively affect both the oral and overall general health of their patient. With this "preventive" service, we will be changing our paradigm of dental care. Instead of treating the dental-related damage of tobacco use, we will work toward preventing the damage by getting our patients to quit their tobacco use. The key is to be positive and keep trying because just a brief message can have a 5 percent success of cessation. You may not see the change, but the next dental provider may get to see the fruit of your efforts.

Further cessation information is available from various sources. The Internet/World Wide Web offers some outstanding resources on tobacco cessation, hazard information, NRT, and the current and future avenues of tobacco research. These sources include the "NicNet," National Institute of Health, Centers for Disease Control, and the Society for Research on Nicotine and Tobacco. Some tobacco-related website addresses are:

<http://www.ahsc.arizona.edu/srnt/>
<http://www.ahsc.arizona.edu/nicnet/>
<http://members.aol.com/powerless/RRR.htm>
<http://www.swen.uwaterloo.ca/~bpekilis/as3/as3.html>

<http://www.oncolink.upenn.edu/>
<http://www.fda.gov/opacom/campaigns/tobacco.html>
<http://www.amhrt.org/hs96/smokeless.html>
<http://iumeded.med.iupui.edu/tobacco/tobacco.htm>
<http://www.ahcpr.gov:80/guide/>

We are fortunate in the military that behavior modification and stress management for interested patients is offered free at local family service centers and medical clinics. Also, the local health promotion coordinator at the local medical clinic can be a resource for tobacco cessation information. As mentioned above, there are many information resources available to the dental team for helping patients quit. The newest information comes from the Agency for Health Care Policy and Research (AHCPR). Copies of the various guides and patient brochures can be ordered by calling 1-800-358-9295. Some of the newer booklets recommended are AHCPR publications #96-0694, #96-0695, and #96-0693. The Internet address for the AHCPR (<http://www.ahcpr.gov:80/guide/>) can be used to obtain these patient brochures.

If you are interested in assisting in formally organized tobacco cessation activities, the local health promotion coordinator and the American Cancer Society can help with facilitator training in this area. If you have any questions, please contact CDR Larry N. Williams at DSN 961-5231/5232, Commercial 757-396-5231/5232, E-mail nrd0dsy@nrd20.med.navy.mil or lnwvyw@norfolk.infi.net

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Dr. Williams is assigned to the Naval Dental Center Norfolk, VA, where he serves as the branch director of the Norfolk Naval Shipyard Branch Dental Clinic. He also offers tobacco cessation education to the Navy Environmental Health Command, Naval Medical Center Portsmouth, VA, and the SurfLant Medical Command.

In Memoriam

RADM Edward C. Raffetto, DC (Ret.), former Chief of the Dental Division, Bureau of Medicine and Surgery, Washington, DC, died of a heart ailment at NNMC Bethesda, MD, on 12 Aug 1997. He was 85.

Dr. Raffetto was born in Manasquan, NJ, on 6 Jan 1912. He received his D.D.S. degree from the University of Pennsylvania in 1935, after which he interned at the U.S. Public Health Service, Marine Hospital, Boston, MA. He was commissioned lieutenant (jg) with the title dental surgeon.

In 1936 he was assigned to the Naval Hospital Chelsea, MA, where he remained until 1937. Ordered to the Asiatic Station, he had consecutive duty at the Cavite Navy Yard, PI, and aboard USS *Black Hawk* (AD-9). He returned to Naval Hospital Chelsea in 1940 and was serving there when the U.S. entered World War II.

In 1942 Dr. Raffetto joined the hospital ship USS *Relief* (AH-1) as senior dental officer, and while aboard saw action during the Gilbert and Marshall Islands campaigns. Between 1944 and 1946 he was officer in charge of the dental prosthetic building at U.S. Marine Barracks, Parris Island, SC. He next reported as senior dental officer aboard USS *Vulcan* (AR-5), and when detached in 1948, reported to Naval Hospital Newport, RI.

Dr. Raffetto returned to sea in 1952 and was as-

signed to USS *Repose* (AH-16) as Chief of Dental Service. From 1953 until 1957 he had duty as senior assistant dental officer at the Naval Administrative Command, Naval Training Center, Bainbridge, MD, after which he served as senior dental officer at NAS Norfolk, VA, with additional duty on the staff of Commander Naval Air Force, Atlantic Fleet. He was assigned to the Dental Division, BUMED in 1960 and

assumed duty as Head, Personnel Branch in June of that year. In August 1963 he became Inspector General, Dental and Assistant Chief of the Dental Division, BUMED. In 1968 he reported as Assistant Chief BUMED for Dentistry and Chief of the Dental Division.

Dr. Raffetto was a member of the American Dental Association, Federation Dentaire Internationale, the Naval Historical Foundation, the U.S. Naval Institute, and a fellow of the American College of Dentists. He also held the China Service Medal, American

Defense Service Medal with star, American Campaign Medal, Asiatic-Pacific Campaign Medal with two engagement stars, World War II Victory Medal, National Defense Service Medal with bronze star, Korean Service Medal with three engagement stars, United Nations Service Medal, and the Korean Presidential Unit Citation Badge.



Naval Medical Research and Development Command Highlights

Navy Medical Research and Development Laboratory System

Navy research scientists conduct basic, clinical, and field research directly related to military requirements and operational needs. Operational medicine is very different from traditional medical care provided at military and civilian hospitals and clinics. Operational medicine specifically focuses on the physical readiness, performance, and safety of those who train and work in a wide variety of military occupations around the world.

Naval Aerospace Medical Research Laboratory: Scientists conduct research and development in human performance and the allied sciences to enhance the health, safety, and readiness of Navy and Marine Corps personnel. The laboratory's programs emphasize operational medicine, selection, training, spatial orientation, and aeromedical standards. Facilities include auditory, visual, vestibular, cognitive, psychopharmacological, and thermal-stress laboratories; three expeditionary mobile field laboratories; and the world's finest collection of man-rated acceleration-research devices. (Visit NAMRL's homepage at <http://www.namrl.navy.mil>)

Naval Submarine Medical Research Laboratory: Scientists are conducting basic and applied research in the biomedical and behavioral sciences aspects of submarine, hyperbaric, and diving environments. Scientific fundamentals are being established for the continued expansion of the physiological limits and capability of man in the sea, whether in diving or closed-habitation mode.

Naval Medical Research Institute: Scientists conduct research in a variety of biomedical disciplines including the physiology of thermal stress and thermal adaptation, diving medicine, immune cell biology, resuscitative medicine, transfusion and cryopreservation, and infectious disease. (Visit NMRI's homepage at <http://131.158.70.70/>)

Naval Medical Research Institute Toxicology Detachment: This detachment is part of a tri-service toxicology program and the Navy's sole toxicology research laboratory. Current programs focus on toxicology of materials in operational environments. The resulting research data are used to develop predictive models for exposure scenarios, to develop more accurate and protective exposure limits, and to recommend medical surveillance and treatment guidelines for potentially exposed personnel. (Visit TOXDET's homepage at www.navy.al.wpafb.af.mil/triinfo/navy/nmrtd.htm)

Naval Medical Research Detachment: Located in Peru, this is the only Navy medical research facility in South America. Research focuses on the diagnosis and treatment of infectious diseases of military importance in South and Central America.

Naval Medical Research Institute Detachment: In support of

Project Reliance and BRAC-91, the Navy's Electromagnetic Radiation (EMR) Bioeffects Research Programs at the Naval Aerospace Medical Research Laboratory, Pensacola, FL, relocated to Brooks Air Force Base, Texas, and activated as a Detachment of NMRI on 1 Oct 1994. This relocation resulted in the collocation of the Army, Navy, and Air Force's EMR programs into a Tri-Service Directed Energy Bioeffects Research Laboratory. The detachment's primary mission is to conduct research, development, testing, and evaluation on the biomedical effects of electromagnetic radiation, such as radiofrequency (RF)/microwaves, lasers, and nonlethal technologies. (Visit NMRI(Brooks) homepage at www.brooks.af.mil/NMRI/nmri.htm)

Naval Dental Research Institute: This is the only DOD laboratory dedicated to dental readiness and oral disease research. Researchers at the institute focus on new methods and materials that limit oral disease, reduce dental emergencies, maximize operational readiness, and promote dental wellness. Researchers focus on characterizing the patient population, identifying better diagnostic and risk assessment techniques, and developing improved methods of prevention and treatment. (Visit NDRI's homepage at <http://support.1.med.navy.mil/ndri/>)

Naval Dental Research Institute Detachment: This detachment coordinates joint basic research and advanced development projects with the National Institute of Health, National Institute of Dental Research, National Institute of Standards and Technology, and the Tri-Service Center for Oral Health Studies at USUHS, with support from the Naval Dental School staff and residents.

Naval Health Research Center: Most of the work conducted at this laboratory is in the advanced development stage of the research or evaluation process and requires close and continuous interaction with operational units of the Navy, Marine Corps, and Special Operations. Research efforts focus on operational epidemiology, medical and performance modeling, operational performance assessment and enhancement, medical informatics, health promotion, readiness standards, and effects of continuous operations. (Visit NHRC's homepage at www.nhrc.navy.mil/)

Naval Medical Research Unit No. 2: Scientists conduct research on the diagnosis and treatment of infectious diseases. The majority of tropical infectious disease of military importance occur in Indonesia where the laboratory is located.

Naval Medical Research Unit No. 3: Scientists conduct a multifaceted basic, clinical, and field research program relating to the health and operational readiness of military personnel assigned or deployed to Southwest Asia or Africa.

Navy Medicine 1916



Surgeon General of the Navy William C. Braisted works in his office at 17th & Pennsylvania Avenue, Washington, DC.

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